

Menomone, Medford, Osceola Mills, and Hayward, Wis. 31st, Alta and Stilson, Iowa; Sault de Ste. Marie, Mich.; North Loup, Nebr.; Huron, S. Dak.; Ellsworth and Shell Lake, Wis.

THUNDERSTORMS.

The more severe thunderstorms reported for the month are referred to under "Local storms."

Thunderstorms were reported as follows: East of the Rocky Mountains thunderstorms were reported in the greatest number of states, 34, on the 11th; in 33 on the 18th; in 31 on the 12th; in 20 to 30 on the 1st, 2d, 3d, 6th, 8th, 9th, 10th, 13th, 14th, 15th, 17th, 19th, 20th, 21st, 24th, 27th, and 28th; in 10 to 19 on the 4th, 7th, 22d, 23d, 25th, and 26th; in 8 on the 30th; and in 7 on the 31st.

East of the Rocky Mountains thunderstorms were reported on the greatest number of dates, 30, in Florida; on 20 to 29 in Georgia, Illinois, Iowa, Kansas, Louisiana, Mississippi, Mis-

souri, Nebraska, North Carolina, South Carolina, South Dakota, Texas, and Wisconsin; on 10 to 19 in Alabama, Arkansas, Connecticut, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Dakota, Ohio, Pennsylvania, Tennessee, Vermont, and Virginia; and on 1 to 9 in Delaware, District of Columbia, Montana, New Hampshire, Oklahoma Territory, Rhode Island, and West Virginia. West of the Rocky Mountains thunderstorms were reported as follows: Arizona, 1st to 12th, 14th to 18th, and 25th to 30th; California, 10th, 11th, 15th, 16th, 17th, 25th to 28th; Colorado, 1st to 9th, 11th to 22d, and 24th to 31st; Nevada, 26th; New Mexico, 1st, 2d, 4th, 6th, 8th, 9th, 10th, 12th, 17th, 18th, 25th to 31st; Oregon, 3d, 4th, 5th, 11th, and 29th; Utah, 1st, 2d, 4th, 5th, 6th, 9th to 20th, 26th, 27th, 28th, and 30th; Washington, 5th, 6th, 11th, 12th, 13th, 15th, 17th, and 24th; Wyoming, 1st to 8th, 11th, 13th, 19th, 21st, 25th, and 30th. In Idaho and Indian Territory no thunderstorms were reported.

MISCELLANEOUS PHENOMENA.

(D) DROUGHT.

In southeast Massachusetts drought seriously affected crops, and many wells were dry. Fruit was injured about Micco, Fla., and cotton was reported damaged about Livingston, Ala. Crops suffered about Fayette, Miss., and Lead Hill, Ark. Drought and cold weather the latter part of the month injured cotton in parts of Louisiana. The month was unusually dry and vegetation was damaged by drought in Brazos county, Tex., Socorro county, N. Mex., Cochise county, Ariz., northwest and east Kansas, and central and northwest Wisconsin. In Polk county, Wis., lakes and ponds were reported lower than ever before observed, and low water in the upper Wis-

consin river prevented milling and logging operations. On the 1st rain broke a drought that had been very destructive to stock and vegetation along the Rio Grande River, Texas, from Presidio to Cameron counties. In the early part of the month crops were badly damaged in southeast Illinois, in Miami and Pulaski counties, Ind., in Fond du Lac county, Wis., and in western Michigan. In parts of Rhode Island and Connecticut mills were stopped on account of insufficient water.

(F) FOREST FIRES.

Forest fires were reported near Cheboygan, Mich., on the 8th; near Manistee, Mich., on the 11th; in Cumberland county, Nova Scotia, on the 14th; and in Nevada county, California, on the 18th.

VERIFICATIONS.

[Verifications made by Assistant Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Room.]

FORECASTS FOR 24 HOURS IN ADVANCE.

The forecasts for districts east of the Rocky Mountains for August, 1891, were made by 1st Lieutenant W. A. Glassford, Signal Corps, and those for the Pacific coast districts were made at San Francisco, Cal., by 1st Lieutenant John P. Finley, 15th Infantry.

Percentages of forecasts verified, August, 1891.

State.	Weather.	Temperature.	Weather and temperature combined.	State.	Weather.	Temperature.	Weather and temperature combined.
Maine	84.2	65.2	76.6	Arkansas	86.8	87.1	86.9
New Hampshire	83.5	67.7	77.2	Tennessee	88.4	89.4	88.9
Vermont	80.6	65.2	74.4	Kentucky	88.1	91.3	89.4
Massachusetts	82.3	68.4	76.7	Ohio	81.9	73.7	81.0
Rhode Island	82.3	84.8	83.3	West Virginia	77.7	78.4	78.0
Connecticut	80.6	77.7	79.4	Indiana	88.1	78.1	84.1
Eastern New York	85.8	74.2	81.2	Illinois	79.4	73.5	77.0
Western New York	87.7	80.6	84.9	Lower Michigan	86.3	74.5	78.0
Eastern Pennsylvania	81.0	64.2	74.3	Upper Michigan	81.6	68.7	76.4
Western Pennsylvania	81.6	81.9	81.7	Wisconsin	82.9	75.8	80.1
New Jersey	84.2	74.5	80.3	Minnesota	88.7	81.3	85.7
Delaware	83.2	72.3	78.8	Iowa	83.2	80.6	82.2
Maryland	82.9	75.2	79.8	Kansas	90.0	73.2	83.3
District of Columbia	73.5	71.9	72.8	Nebraska	84.5	75.2	80.3
Virginia	80.3	73.5	77.6	Missouri	89.7	82.6	86.9
North Carolina	78.7	74.2	76.9	Colorado	93.2	71.0	84.3
South Carolina	77.1	82.6	79.3	North Dakota	80.0	73.9	83.0
Georgia	85.2	88.7	86.6	South Dakota	82.3	75.1	79.8
Eastern Florida	87.1	92.3	89.2	Northern California	95.8	82.3	96.4
Western Florida	80.3	90.3	84.3	Southern California	97.1	86.8	93.0
Alabama	91.9	85.5	86.3	Oregon	95.2	83.2	90.4
Mississippi	90.6	89.4	90.1	Washington	93.2	89.4	91.7
Louisiana	92.6	95.8	93.9				
Texas	90.3	95.1	92.6	Monthly percentage	84.4	78.7	82.1

In determining the monthly percentage of weather and temperature combined, the

Pacific coast states are not included. The forecasts of temperature in districts east of the Rocky Mountains for August, 1891, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day. The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

FORECASTS FOR 48 AND 72 HOURS IN ADVANCE.

Appreciating the great importance that long time predictions possess for the general public the Chief of the Weather Bureau has authorized forecasts for 48 and 72 hours, covering the 2d and 3d days in advance. These are optional with the forecast official, and are only made when clearly in the public interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 589; temperature, 392. Percentages of verifications: weather, 76.8; temperature, 79.6; weather and temperature combined, 77.7.

Percentages of verifications of forecasts made for third day in advance. Number of predictions made: weather, 30; temperature, 29. Percentages of verifications: weather, 83.7; temperature, 81.0; weather and temperature combined, 82.6.

WIND SIGNALS FOR AUGUST, 1891.

Statement showing percentages of justifications of wind signals for the month of August, 1891.

Wind signals—(Ordered by Lieut. W. A. Glassford.)—Total number of signals ordered, 14; justified as to velocity, 9; justified as to direction, 12. All of the signals ordered were cautionary; 5 signals were ordered for easterly winds, and 9 were ordered for westerly winds. Percentage of justifications, 41.0. Number of winds without signals, 12. Number of signals ordered late, 8.

No cold-wave signals were ordered, and no temperature-fall warnings were issued during the month.